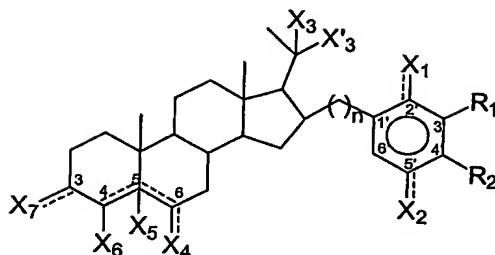


CLAIMS

1. A compound having the structural formula IB or a pharmaceutically acceptable salt thereof,



formula IB

wherein X_1 , X_2 , R_1 and R_2 are independently selected from the group comprising oxo, hydrogen, hydroxyl, oxyalkyl, alkyl, alkenyl, alkynyl, alkyloxy, alkyloxyalkyl, alkylthioalkyl, alkoxycarbonyl, alkylthiocarbonyl, alkanoyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkanoyl, cycloalkylthiocarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkoxythiocarbonyl, cycloalkylthioalkyl, alkylcarbonyloxyalkyl, cycloalkylcarbonyloxyalkyl, silyloxyalkyl, aralkyl, arylalkenyl, arylcarbonyl, aryloxycarbonyl, arylthiocarbonyl, aralkoxycarbonyl, arylalkylthiocarbonyl, aryloxyalkyl, arylthioalkyl, haloalkyl, hydroxyalkyl, aralkanoyl, aroyl, aryloxycarbonylalkyl, aryloxyalkanoyl, carboxyl, alkenylcarbonyl, alkynylcarbonyl, Het¹, Het¹alkyl, Het¹oxyalkyl, Het¹aryl, Het¹aralkyl, Het¹cycloalkyl, Het¹alkoxycarbonyl, Het¹alkylthiocarbonyl, Het¹oxycarbonyl, Het¹thiocarbonyl, Het¹alkanoyl, Het¹aralkanoyl, Het¹aryloxyalkyl, Het¹alkyloxyalkyl, Het¹arylthioalkyl, Het¹aryloxycarbonyl, Het¹aralkoxycarbonyl, Het¹aroyl, Het¹oxyalkylcarbonyl, Het¹alkyloxyalkylcarbonyl, Het¹aryloxyalkylcarbonyl, Het¹carbonyloxyalkyl, Het¹alkylcarbonyloxyalkyl, Het¹aralkylcarbonyloxyalkyl, Het²alkyl, Het²oxyalkyl, Het²alkyloxyalkyl, Het²aralkyl, Het²carbonyl, Het²oxycarbonyl, Het²thiocarbonyl, Het²alkanoyl, Het²alkylthiocarbonyl, Het²alkoxycarbonyl, Het²aralkanoyl, Het²aralkoxycarbonyl, Het²aryloxycarbonyl, Het²aroyl, Het²aryloxyalkyl, Het²arylthioalkyl, Het²oxyalkylcarbonyl, Het²alkyloxyalkylcarbonyl, Het²aryloxyalkylcarbonyl, Het²carbonyloxyalkyl, Het²alkylcarbonyloxyalkyl, Het²aralkylcarbonyloxyalkyl, cyano, CR³=NR⁴, CR³=N(OR⁴), aminocarbonyl, aminoalkanoyl, aminoalkyl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl, aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_n, hydroxy, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently

selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, arylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, cycloalkyl, cycloalkylalkyl, Het¹, Het², Het¹alkyl, Het²alkyl, Het¹amino, Het²amino, Het¹alkylamino, Het²alkylamino, Het¹thio, Het²thio, Het¹alkylthio, Het²alkylthio, Het¹oxy and Het²oxy, OR³, SR³, SO₂NR³R⁴, SO₂N(OH)R³, CN, CR³=NR⁴, S(O)R³, SO₂R³, CR³=N(OR⁴), N₃, NO₂, NR³R⁴, N(OH)R³, C(O)R³, C(S)R³, CO₂R³, C(O)SR³, C(O)NR³R⁴, C(S)NR³R⁴, C(O)N(OH)R⁴, C(S)N(OH)R³, NR³C(O)R⁴, NR³C(S)R⁴, N(OH)C(O)R⁴, N(OH)C(S)R³, NR³CO₂R⁴, NR³C(O)NR⁴R⁵, and NR³C(S)NR⁴R⁵, N(OH)CO₂R³, NR³C(O)SR⁴, N(OH)C(O)NR³R⁴, N(OH)C(S)NR³R⁴, NR³C(O)N(OH)R⁴, NR³C(S)N(OH)R⁴, NR³SO₂R⁴, NHSO₂NR³R⁴, NR³SO₂NHR⁴, P(O)(OR³)(OR⁴), wherein t is an integer between 1 and 2 and R³, R⁴ and R⁵ are each independently selected from the group comprising hydrogen, hydroxyl, alkyl, alkenyl, alkynyl, aminoalkyl, aminoaryl, alkylcarbonylamino, arylcarbonylamino, alkylthiocarbonylamino and arylthiocarbonylamino;

wherein X₃ participates together with X₃' to an oxo functional group, or wherein X₃ is selected from the group comprising hydrogen, hydroxyl, sulfur, oxyalkyl, oxycarbonyl, alkyl, Het¹alkyl, alkenyl, alkynyl, aminoalkyl, aminoacyl, alkylcarbonylamino, alkylthiocarbonylamino, Het¹, glycosyl, thio derivatives thereof, amino derivatives thereof, hydroxyl-protected derivatives thereof, alkyloxycarbonyl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl and aminocarbonyl; and X₃' is selected from the group comprising hydrogen, alkyl, aryl, Het¹, glycosyl, thio derivatives thereof, amino derivatives thereof, hydroxyl-protected derivatives thereof, aralkyl, and optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl, aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_t, hydroxy, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, arylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, cycloalkyl and cycloalkylalkyl;

wherein X₄ and X₇ are independently selected from the group comprising hydrogen, halogen, oxygen, oxo, carbonyl, thiocarbonyl, hydroxyl, alkyl, aryl, Het¹,

glycosyl, thio derivatives thereof, amino derivatives thereof, hydroxyl-protected derivatives thereof, Het¹alkyl, Het¹aryl, alkenyl, alkynyl, hydroxyalkyl, hydroxycarbonyl, hydroxycarbonylalkyl, hydroxycarbonylaryl, hydroxycarbonyloxyalkyl and hydroxycarbonyloxyaryl; aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_n, hydroxy, aminoalkyl, aminoaryl, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, arylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, Het¹, Het², alkyloxycarbonyl, carboxyl, aminocarbonyl, cycloalkyl and cycloalkylalkyl;

wherein X₅ participates to a double bond between the carbon atoms in position 4 and 5 or between carbon atoms in position 5 and 6, and X₆ is independently selected from the group comprising hydrogen, hydroxyl and hydroxyalkyl, or wherein X₅ and X₆ are independently selected from the group comprising halogen, hydrogen, hydroxyl, hydroxyalkyl, aminoalkyl, aminoaryl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl, aminocarbonyl, and

wherein n is an integer between 0 and 10,

provided that when X₆ and X₄ are H, when X₅ participates to a double bond between the carbon atoms in position 5 and 6, when X₃ participates together with X₃' to an oxo functional group, when n is zero and X₁, X₂, R₁ and R₂ are H, X₇ is not hydroxyl.

2. A compound according to claim 1,

wherein X₁, X₂, R₁ and R₂ are independently selected from the group comprising oxo, hydrogen, hydroxyl, oxyalkyl, alkyl, alkenyl, alkynyl, alkyloxy, alkyloxyalkyl, alkylthioalkyl, alkoxycarbonyl, alkylthiocarbonyl, alkanoyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkanoyl, cycloalkylthiocarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkoxythiocarbonyl, cycloalkylthioalkyl, alkylcarbonyloxyalkyl, cycloalkylcarbonyloxyalkyl, silyloxyalkyl, aralkyl, arylalkenyl, arylcarbonyl, aryloxy, arylthiocarbonyl, aralkoxycarbonyl, arylalkylthiocarbonyl, aryloxyalkyl, arylthioalkyl, haloalkyl, hydroxyalkyl, aralkanoyl, aroyl, aryloxyalkyl, aryloxyalkanoyl, carboxyl, alkenylcarbonyl, alkynylcarbonyl, Het¹, Het¹alkyl, Het¹oxyalkyl, Het¹aryl, Het¹aralkyl, Het¹cycloalkyl, Het¹alkoxycarbonyl, Het¹alkylthiocarbonyl, Het¹oxycarbonyl, Het¹thiocarbonyl, Het¹alkanoyl, Het¹aralkanoyl, Het¹aryloxyalkyl, Het¹alkyloxyalkyl,

Het¹arylthioalkyl, Het¹aryloxy carbonyl, Het¹aralkoxycarbonyl, Het¹aroyle, Het¹oxyalkylcarbonyl, Het¹alkyloxyalkylcarbonyl, Het¹aryloxyalkylcarbonyl, Het¹carbonyloxyalkyl, Het¹alkylcarbonyloxyalkyl, Het¹aralkylcarbonyloxyalkyl, Het²alkyl, Het²oxyalkyl, Het²alkyloxyalkyl, Het²aralkyl, Het²carbonyl, Het²oxycarbonyl, Het²thiocarbonyl, Het²alkanoyl, Het²alkylthiocarbonyl, Het²alkoxycarbonyl, Het²aralkanoyl, Het²aralkoxycarbonyl, Het²aryloxy carbonyl, Het²aroyle, Het²aryloxyalkyl, Het²arylthioalkyl, Het²oxyalkylcarbonyl, Het²alkyloxyalkylcarbonyl, Het²aryloxyalkylcarbonyl, Het²carbonyloxyalkyl, Het²alkylcarbonyloxyalkyl, Het²aralkylcarbonyloxyalkyl, cyano, CR³=NR⁴, CR³=N(OR⁴), aminocarbonyl, aminoalkanoyl, aminoalkyl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxy carbonyl, carboxyl, aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_t, hydroxy, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, arylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, cycloalkyl, cycloalkylalkyl, Het¹, Het², Het¹alkyl, Het²alkyl, Het¹amino, Het²amino, Het¹alkylamino, Het²alkylamino, Het¹thio, Het²thio, Het¹alkylthio, Het²alkylthio, Het¹oxy and Het²oxy, OR³, SR³, SO₂NR³R⁴, SO₂N(OH)R³, CN, CR³=NR⁴, S(O)R³, SO₂R³, CR³=N(OR⁴), N₃, NO₂, NR³R⁴, N(OH)R³, C(O)R³, C(S)R³, CO₂R³, C(O)SR³, C(O)NR³R⁴, C(S)NR³R⁴, C(O)N(OH)R⁴, C(S)N(OH)R³, NR³C(O)R⁴, NR³C(S)R⁴, N(OH)C(O)R⁴, N(OH)C(S)R³, NR³CO₂R⁴, NR³C(O)NR⁴R⁵, and NR³C(S)NR⁴R⁵, N(OH)CO₂R³, NR³C(O)SR⁴, N(OH)C(O)NR³R⁴, N(OH)C(S)NR³R⁴, NR³C(O)N(OH)R⁴, NR³C(S)N(OH)R⁴, NR³SO₂R⁴, NHSO₂NR³R⁴, NR³SO₂NHR⁴, P(O)(OR³)(OR⁴), wherein t is an integer between 1 and 2 and R³, R⁴ and R⁵ are each independently selected from the group comprising hydrogen, hydroxyl, alkyl, alkenyl, alkynyl, aminoalkyl, aminoaryl, alkylcarbonylamino, arylcarbonylamino alkylthiocarbonylamino and arylthiocarbonylamino;

wherein X₃ participates together with X₃' to an oxo functional group, or wherein X₃ is selected from the group comprising hydrogen, hydroxyl, sulfur, oxyalkyl, oxycarbonyl, alkyl, Het¹alkyl, alkenyl, alkynyl, aminoalkyl, aminoacyl, alkylcarbonylamino, alkylthiocarbonylamino, Het¹, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrosyl, rhamnosyl, threosyl, sorbosyl, psicose, tagatose, fucose, arabinose, xylofuranose, lyxose, talose, psicose, idose, gulose, altrose, allose, mannoheptulose, sedoheptulose, abequose, isomaltose, kojibiose, laminarabiose,

nigerosyl, primeverosyl, rutinosyl, tyvelosyl, maltosyl, lactosyl, sucrosyl, cellobiosyl, trehalosyl, gentiobiosyl, melibiosyl, turanosyl, sophorosyl, isosucrosyl, raffineryl, gentianosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, di-, tri-, oligo- and polysaccharide thereof, alkyloxycarbonyl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl and aminocarbonyl; and X₃' is selected from the group comprising hydrogen, alkyl, aryl, Het¹, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psiceryl, tagatosyl, fucosyl, arabinosyl, xylofuranosyl, lyxosyl, talosyl, psiceryl, idosyl, gulosyl, altrosyl, allosyl, mannoheptulosyl, sedoheptulosyl, abequosyl, isomaltosyl, kojibiosyl, laminarabiosyl, nigerosyl, primeverosyl, rutinosyl, tyvelosyl, maltosyl, lactosyl, sucrosyl, cellobiosyl, trehalosyl, gentiobiosyl, melibiosyl, turanosyl, sophorosyl, isosucrosyl, raffineryl, gentianosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, di-, tri-, oligo- and polysaccharide thereof, aralkyl, and optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl, aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_n, hydroxy, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, aylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, cycloalkyl and cycloalkylalkyl;

wherein X₄ and X₇ are independently selected from the group comprising hydrogen, oxygen, halogen, oxo, carbonyl, thiocarbonyl, hydroxyl, alkyl, aryl, Het¹, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl,

erythrulosyl, rhamnosyl, threosyl, sorbosyl, psicosyl, tagatosyl, fucosyl, arabinosyl, xylofuranosyl, lyxosyl, talosyl, psicosyl, idosyl, gulosyl, altrosyl, allosyl, mannoheptulosyl, sedoheptulosyl, abequosyl, isomaltosyl, kojibiosyl, laminarabiosyl, nigerosyl, primeverosyl, rutinosyl, tyvelosyl, maltosyl, lactosyl, sucrosyl, cellobiosyl, trehalosyl, gentiobiosyl, melibiosyl, turanosyl, sophorosyl, isosucrosyl, raffineryl, gentianosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, di-, tri-, oligo- and polysaccharide thereof; Het¹alkyl, Het¹aryl, alkenyl, alkynyl, hydroxyalkyl, hydroxycarbonyl, hydroxycarbonylalkyl, hydroxycarbonylaryl, hydroxycarbonyloxyalkyl, and hydroxycarbonyloxyaryl; aminocarbonyl, mono- or di(alkyl)aminocarbonyl, aminosulfonyl, alkylS(=O)_n, hydroxy, aminoalkyl, aminoaryl, cyano, halogen or amino optionally mono- or disubstituted wherein the substituents are independently selected from the group comprising alkyl, aryl, aralkyl, aryloxy, arylamino, arylthio, aryloxyalkyl, arylaminoalkyl, aralkoxy, alkylthio, alkoxy, aryloxyalkoxy, arylaminoalkoxy, aralkylamino, aryloxyalkylamino, arylaminoalkylamino, arylthioalkoxy, arylthioalkylamino, aralkylthio, aryloxyalkylthio, arylaminoalkylthio, arylthioalkylthio, alkylamino, Het¹, Het², alkylloxycarbonyl, carboxyl, aminocarbonyl, cycloalkyl and cycloalkylalkyl;

wherein X₅ participates to a double bond between the carbon atoms in position 4 and 5 or between carbon atoms in positions 5 and 6, and X₆ is independently selected from the group comprising hydrogen, hydroxyl and hydroxyalkyl, or

wherein X₅ and X₆ are independently selected from the group comprising halogen hydrogen, hydroxyl, hydroxyalkyl, aminoalkyl, aminoaryl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkylloxy, alkylloxycarbonyl, carboxyl, aminocarbonyl, and

wherein n is an integer between 0 and 10.

3. A compound according to claim 1 or 2,

wherein X₁, X₂, R₁ and R₂ is selected from the group comprising hydrogen, hydroxyl, oxyalkyl, oxo, alkyl, alkenyl, alkynyl, alkylloxy, alkylloxyalkyl, alkylthioalkyl, alkoxycarbonyl, alkylthiocarbonyl, alkanoyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkanoyl, cycloalkylthiocarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkoxythiocarbonyl, cycloalkylthioalkyl, alkylcarbonyloxyalkyl,

cycloalkylcarbonyloxyalkyl, silyloxyalkyl, aralkyl, arylalkenyl, arylcarbonyl, aryloxyalkyl, arylthiocarbonyl, aralkoxycarbonyl, arylalkylthiocarbonyl, aryloxyalkyl, arylthioalkyl, haloalkyl, hydroxyalkyl, aralkanoyl, aroyl, aryloxyalkyl, aryloxyalkanoyl, carboxyl, alkenylcarbonyl and alkynylcarbonyl;

wherein X_3 participates together with X_3' to an oxo functional group, or wherein X_3 is selected from the group comprising hydrogen, hydroxyl, sulfur, oxyalkyl, oxycarbonyl alkyl, Het¹alkyl, alkenyl, alkynyl, aminoalkyl, aminoacyl, alkylcarbonylamino, alkylthiocarbonylamino, Het¹, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psicose, tagatosyl, fucosyl, arabinosyl, xylofuranosyl, lyxosyl, talosyl, psicose, idosyl, gulose, allose, allosyl, mannoheptulosyl, sedoheptulosyl, abequosyl, isomaltosyl, kojibiosyl, laminarabiosyl, nigerosyl, primeverosyl, rutinose, tyvelosyl, maltosyl, lactosyl, sucrose, cellobiosyl, trehalose, gentiobiosyl, melibiosyl, turanosyl, sophorose, isosucrose, raffinose, gentianose, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof, alkyloxyalkyl optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxyalkyl, carboxyl and aminocarbonyl; and X_3' is selected from the group comprising hydrogen, alkyl, aryl, aralkyl, Het¹, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psicose, tagatosyl, fucosyl, arabinosyl, xylofuranosyl, lyxosyl, talosyl, psicose, idosyl, gulose, allose, allosyl, mannoheptulosyl, sedoheptulosyl, abequosyl, isomaltosyl, kojibiosyl, laminarabiosyl, nigerosyl, primeverosyl, rutinose, tyvelosyl, maltosyl, lactosyl, sucrose, cellobiosyl, trehalose, gentiobiosyl, melibiosyl, turanosyl, sophorose, isosucrose, raffinose, gentianose, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof;

wherein X_4 and X_7 are independently selected from the group comprising hydrogen, oxygen, oxo, carbonyl, thiocarbonyl, hydroxyl, alkyl, aryl, Het¹, Het¹alkyl, Het¹aryl, alkenyl, alkynyl, hydroxyalkyl, hydroxycarbonyl, hydroxycarbonylalkyl, hydroxycarbonylaryl, hydroxycarbonyloxyalkyl, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psiceryl, tagatosyl, fucosyl, arabinosyl, xylofuranosyl, lyxosyl, talosyl, psiceryl, idosyl, gulosyl, altrosyl, allosyl, mannoheptulosyl, sedoheptulosyl, abequosyl, isomaltosyl, kojibiosyl, laminarabiosyl, nigerosyl, primeverosyl, rutinosyl, tyvelosyl, maltosyl, lactosyl, sucrosyl, cellobiosyl, trehalosyl, gentiobiosyl, melibiosyl, turanosyl, sophorosyl, isosucrosyl, raffineryl, gentianosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, 2-amino-1,3-cyclohexanediol, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof;

wherein X_5 participates to a double bond between the carbon atoms in position 4 and 5 or between carbon atoms in positions 5 and 6, and X_6 is independently selected from the group comprising hydrogen, hydroxyl, and hydroxyalkyl, or wherein X_5 and X_6 are independently selected from the group comprising hydrogen, hydroxyl, hydroxyalkyl, aminoalkyl, aminoaryl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxy-carbonyl, carboxyl, aminocarbonyl, and

wherein n is an integer between 0 and 5.

4. A compound according to any of claims 1 to 3,

wherein X_1 , X_2 , R_1 and R_2 is selected from the group comprising hydrogen, hydroxyl, alkyloxy, oxo and oxyalkyl,

wherein X_3 participates together with X_3' to an oxo functional group, or wherein X_3 is selected from the group comprising hydrogen, hydroxyl, oxyalkyl, oxycarbonyl, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psiceryl, tagatosyl, fucosyl, arabinosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination

thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof; and X'_3 is selected from the group comprising alkyl, aryl and aralkyl, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psicose, tagatosyl, fucosyl, arabinosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof;

wherein X_4 and X_7 are independently selected from the group comprising hydrogen, oxygen, oxo, hydroxyl, glucosyl, fructosyl, galactosyl, mannosyl, ribosyl, ribulosyl, xylulosyl, erythrosyl, erythrulosyl, rhamnosyl, threosyl, sorbosyl, psicose, tagatosyl, fucosyl, arabinosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, 2-amino-2-deoxy mannosyl, 2-acetamido-2-deoxy-mannosyl, L or D isomers thereof, α or β form thereof, pyranose or furanose form thereof, combination thereof, deoxy derivatives thereof, hydroxyl-protected acetate derivatives thereof, amino derivatives thereof, thio derivatives thereof, disaccharide thereof, trisaccharide thereof, oligosaccharide and polysaccharide thereof;

wherein X_5 and X_6 are hydrogen or wherein X_5 participates to a double bond between the carbon atoms in position 4 and 5, and X_6 is hydrogen, and

wherein n is an integer between 0 and 2.

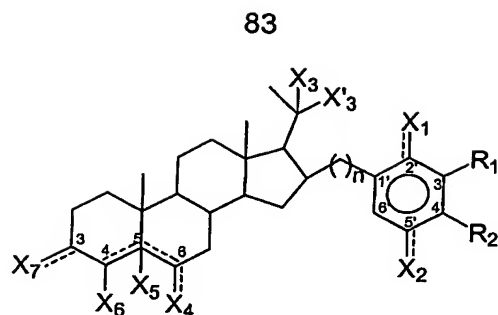
5. A compound according to any of claims 1 to 4,

wherein X_1 , X_2 , X_3 , X'_3 , X_6 , X_7 , R_1 , R_2 and n are selected from the group indicated in claims 1 to 3; and

wherein X_4 is equal to X_5 and is selected from the group comprising halogen, aminoalkyl, aminoaryl, optionally substituted by one or more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl and aminocarbonyl, or wherein X_5 participates to a double bond between the carbon atoms in position 5 and 6, and X_4 is independently selected from the group comprising hydrogen, aminoalkyl, aminoaryl, optionally substituted by one or

more substituents independently selected from the group comprising alkyl, aralkyl, aryl, Het¹, Het², cycloalkyl, alkyloxy, alkyloxycarbonyl, carboxyl and aminocarbonyl.

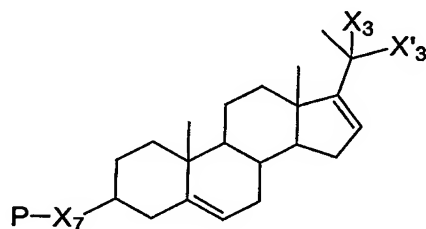
6. A compound according to any of claims 1 to 4, wherein X₁ and X₂ are –OMe, wherein R₁ and R₂ are –H, wherein X₄ is hydrogen, wherein X₃ participates together with X₃' to an oxo functional group, wherein X₅ participates to a double bond between the carbon atoms in position 4 and 5, wherein X₆ is hydrogen, wherein X₇ is hydroxyl, glucosyl, fructosyl, galactosyl, mannosyl, fucosyl, cellobiosyl, gentiobiosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, disaccharide or trisaccharide thereof; and wherein n is 0.
7. A compound according to any of claims 1 to 4, wherein X₁ and X₂ are –OMe, wherein R₁ and R₂ are –H, wherein X₃ is hydrogen, hydroxyl, oxyalkyl or oxycarbonyl, wherein X₃' is glucosyl, fructosyl, galactosyl, mannosyl, fucosyl, cellobiosyl, gentiobiosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, a disaccharide or a trisaccharide thereof, wherein X₄ is hydrogen, wherein X₅ participates to a double bond between the carbon atoms in position 5 and 6, wherein X₆ is –H, wherein X₇ is hydrogen, oxygen, hydroxyl or oxo, and wherein n is 0.
8. A compound according to any of claims 1 to 4, wherein X₁ and X₂ are –OMe, wherein R₁ and R₂ are –H, wherein X₃ is glucosyl, fructosyl, galactosyl, mannosyl, fucosyl, cellobiosyl, gentiobiosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, a disaccharide or a trisaccharide thereof, wherein X₃' is hydrogen, alkyl or aralkyl, wherein X₄ is hydrogen, wherein X₅ participates to a double bond between the carbon atoms in position 5 and 6, wherein X₆ is –H, wherein X₇ is hydrogen, oxygen, hydroxyl or oxo, and wherein n is 0.
9. A compound according to any of claims 1 to 4, wherein X₁ and X₂ are –OMe, wherein R₁ and R₂ are –H, wherein X₃ participates together with X₃' to an oxo functional group, wherein X₄ is hydroxyl, glucosyl, fructosyl, galactosyl, mannosyl, fucosyl, cellobiosyl, gentiobiosyl, 2-amino-2-deoxy glucosyl, 2-acetamido-2-deoxy-glucosyl, 2-amino-2-deoxy galactosyl, 2-acetamido-2-deoxy-galactosyl, a disaccharide or a trisaccharide thereof, wherein X₅ participates to a double bond between the carbon atoms in position 5 and 6, wherein X₆ is –H, wherein X₇ is hydrogen, oxygen, hydroxyl or oxo, and wherein n is 0.
10. Compound of formula IB a pharmaceutically acceptable salt thereof, wherein X₁, X₂, X₃, X₃', X₄, X₅, X₆, X₇, R₁, R₂ and n are selected as indicated in Table A or Table B.
11. Method for synthesizing a compound having the structural formula IB



formula IB

wherein X_1 , X_2 , X_3 , X_4 , X_5 , X_6 , X_7 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, said method comprising the steps of

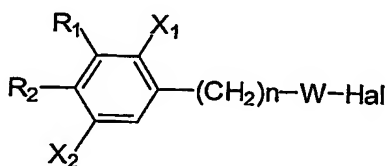
- a) providing a starting material having the structural formula IV,



formula IV

wherein X_3 , X_3' and X_7 are selected from the group as indicated in any of claims 1 to 10, and wherein P is a protecting group,

- b) effecting reaction between the compound of step a) with an organometallic compound having the structural formula V

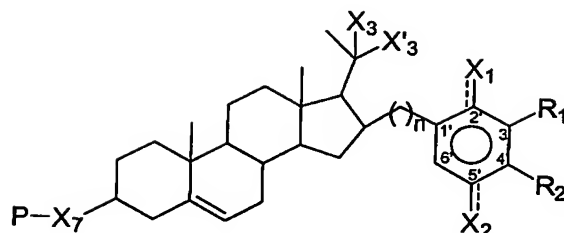


formula V

wherein X_1 , X_2 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, wherein W is a metal or a combination of metals and wherein Hal is a halogen atom,

to result in an intermediate having the structural formula III'B

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formula III'B

wherein X_1 , X_2 , X_3 , X_3' , X_7 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, and wherein p is a protecting group,

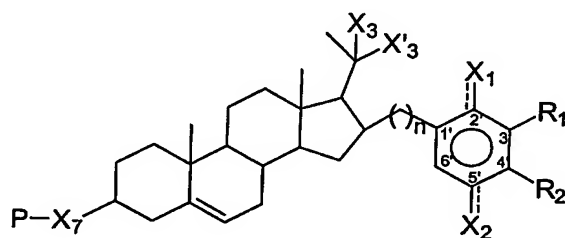
c) effecting reaction between the compound of step b) with an organometallic compound having the structural formula VI



formula VI

wherein X'_3 is selected from the group as indicated in any of claims 1 to 10, wherein W is a metal or a combination of metals, and wherein Hal is a halogen atom,

to result in an intermediate having the structural formula IIIB

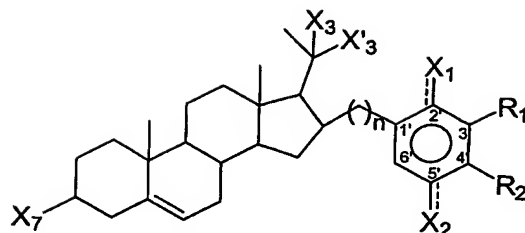


formula IIIB

wherein X_1 , X_2 , X_3 , X_3' , X_7 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, wherein P is a protecting group,

d) deprotecting the X_7 group of the compound obtained in step c) to form an compound having the structural formula IIB

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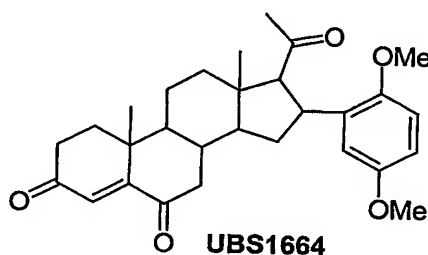
formula II B

wherein X_1 , X_2 , X_3 , X_3' , X_7 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, and

- e) oxidizing by reaction with a suitable oxidizing agent or agents to form a compound of formula IB or
- e) coupling an O-protected glycosyl or non-protected glycosyl to form a compound of formula IIB wherein X_1 , X_2 , X_3 , X_3' , X_7 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10 and X_7 is an O-protected glycosyl or a non-protected glycosyl, and
- f) deprotecting the O-protected groups of glycosyl to form a compound of formula IB wherein X_1 , X_2 , X_3 , X_3' , X_4 , X_5 , X_6 , R_1 , R_2 and n are selected from the group as indicated in any of claims 1 to 10, and X_7 is a glycosyl, thio derivatives thereof, amino derivatives thereof, hydroxyl-protected derivatives thereof.

12. A compound obtainable by any of the steps according to the method of claim 11.

13. A compound designated as compound UBS1664



14. A compound designated as compound UBS3327.

